Run13 detector α tests

polar. mtg.
09.01.13

- BNL 1mm wide strip detectors
- 3 wafers (1699, 1700, 1701), 18 det. each wafer
- Several det. rejected after dark current tests (summary on wiki)
- We have (so far) 30 detectors mounted on ceramic boards

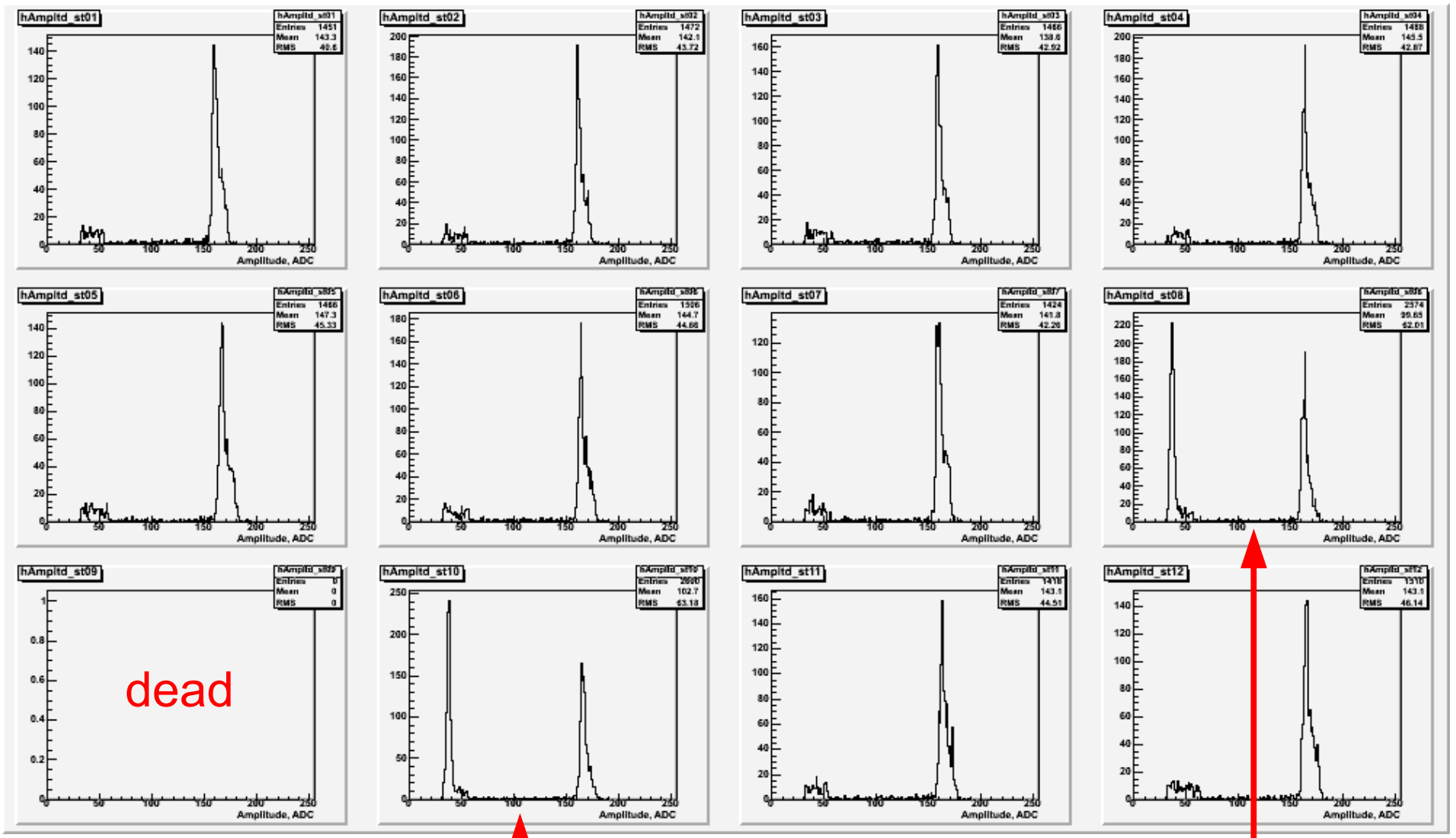
Tests with α source:

- Test stand in RHIC tunnel (Tony C. & crew)
- Small vacuum chamber with ^{241}Am α source
- V_{bias} = 110 V (nominal)
- Read out with usual RHIC polarimeter DAQ (yellow)
- 15 minute runs

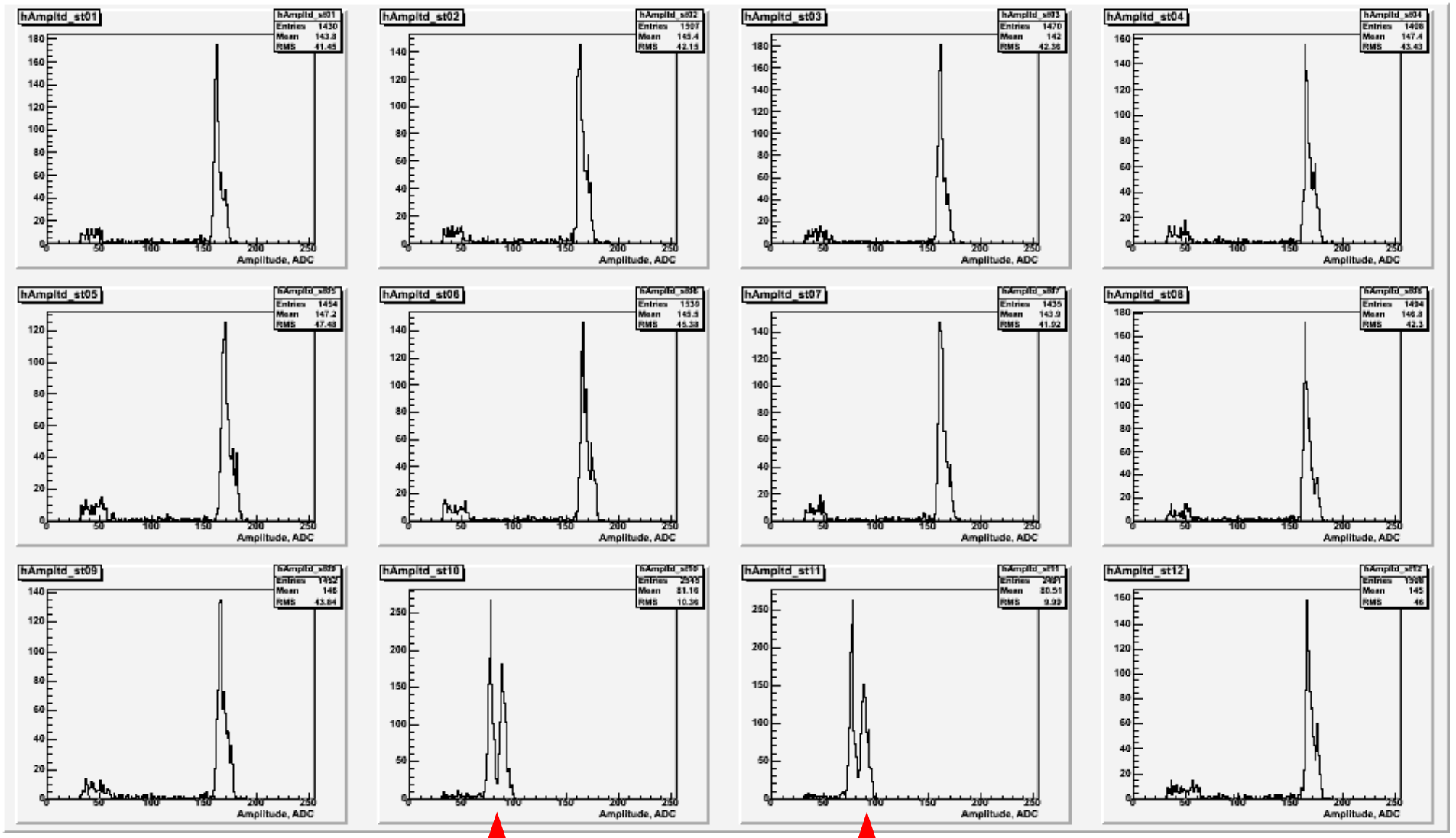
Results:

- 27 detectors OK as far as α tests
- Bad detectors: 1700-3 1 dead chan. (chan. 3)
  1701-2 1 dead chan., 2 noisy chan. (next slide)
  1701-6 2 chan. ½ height α peak & noisy (next next slide)

Bad det. 1701-2



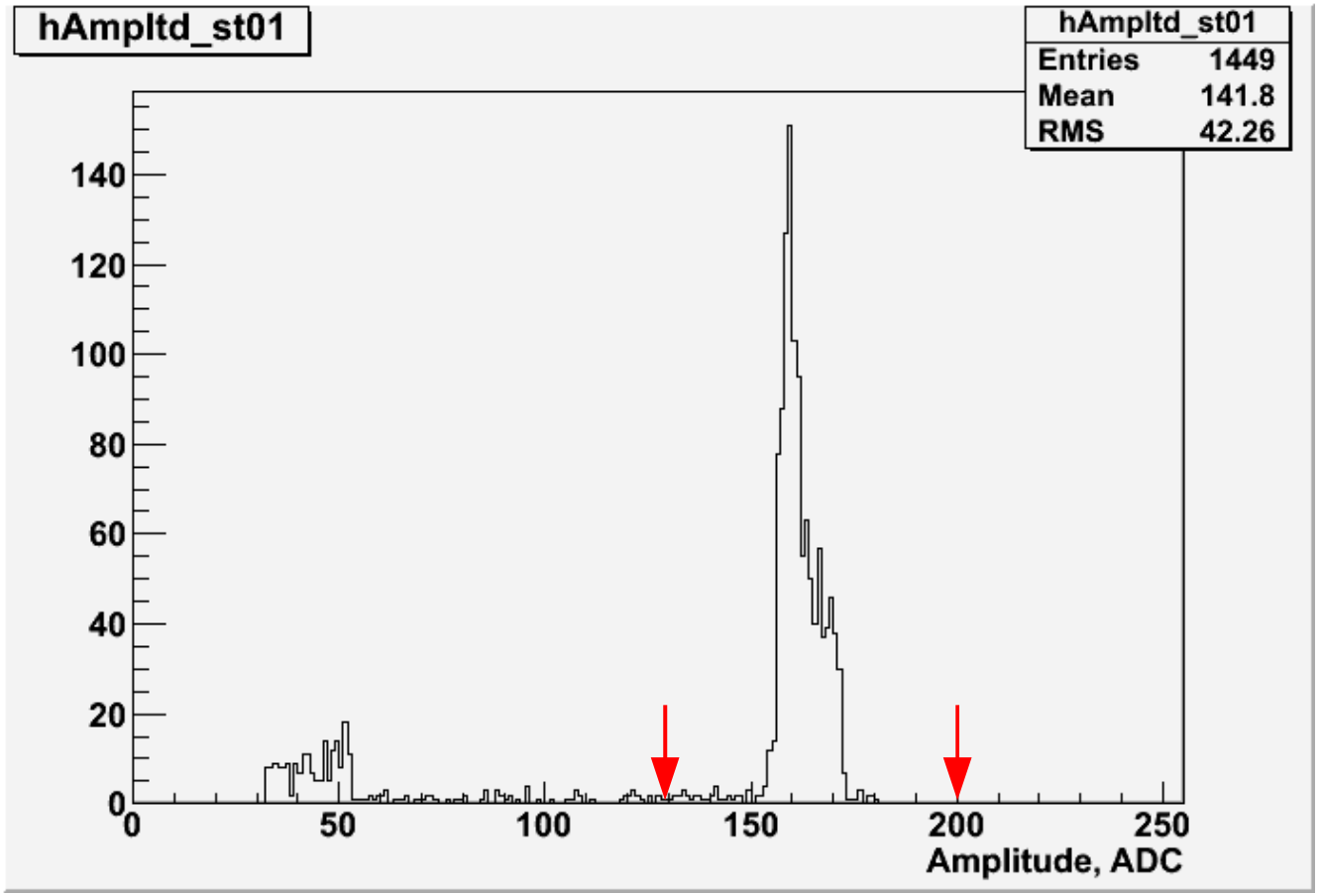
Bad det. 1701-6



½ height α peak & noise peak

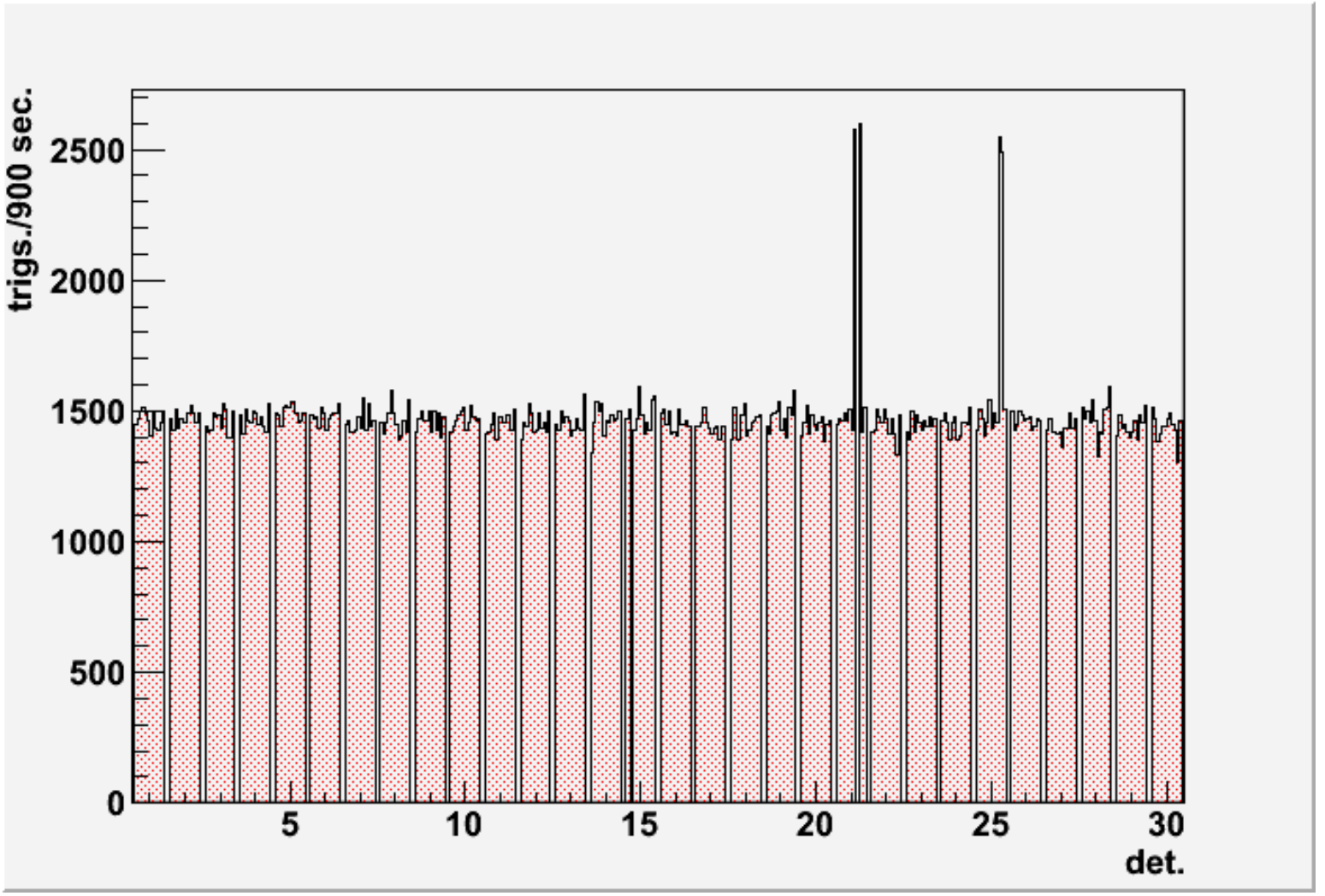
Summarize

- Most channels nice α peak like this:



  - Summarize all channels: # triggers
    mean in peak region
    RMS in peak region

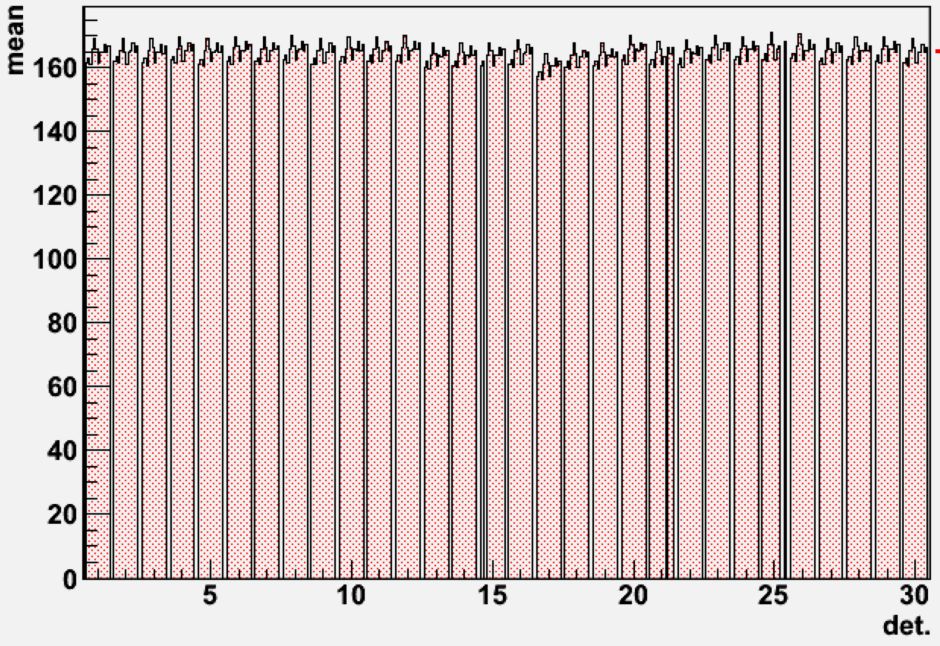
Summary: #trigs. / chan.



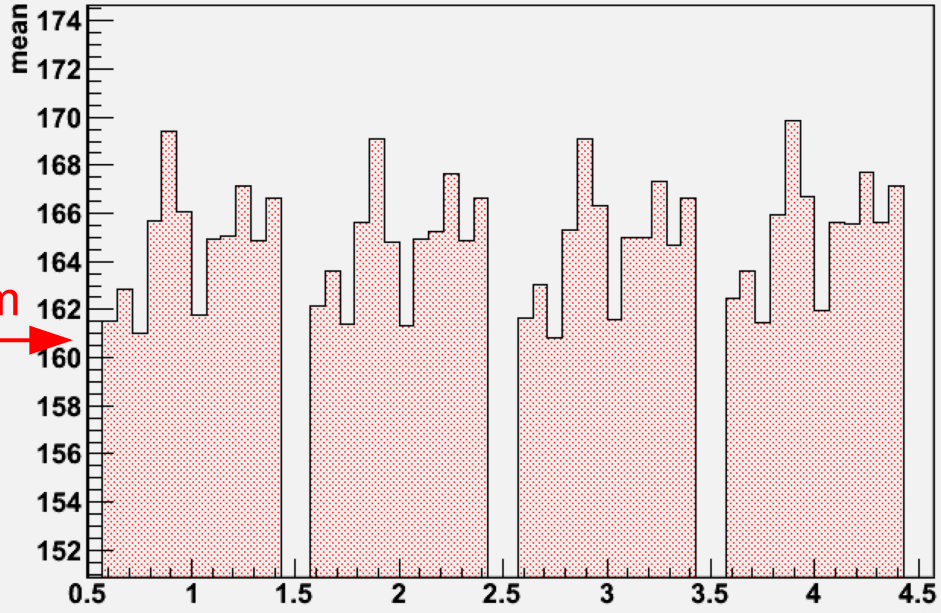
- Except for 4 noisy chans. ~same # triggers per channel (α efficiency)

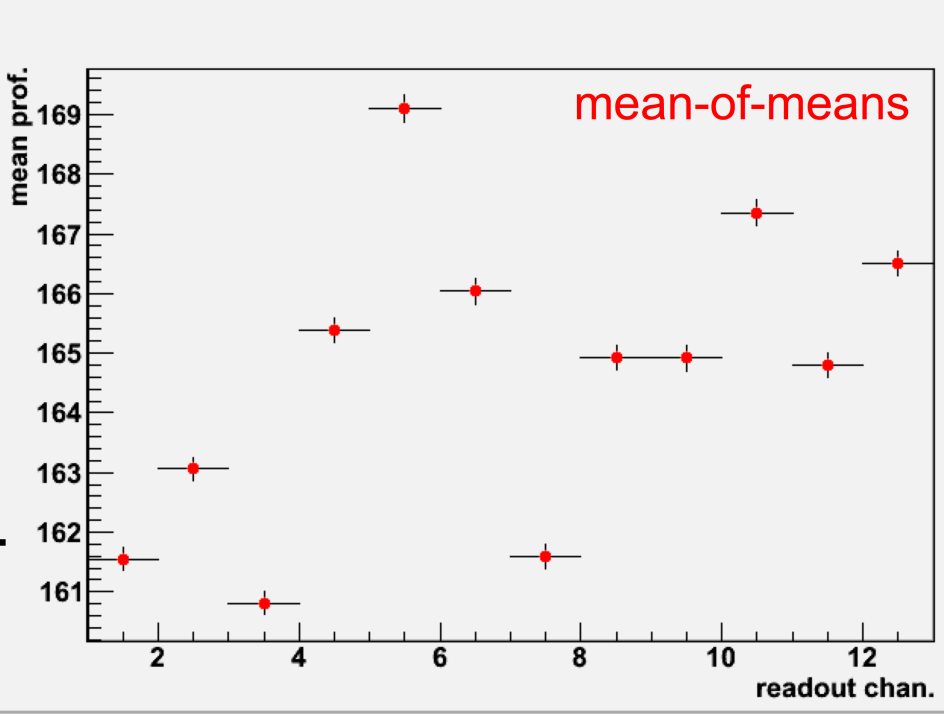
Summary: mean / chan.

- Mean variations dominated by readout channel variations



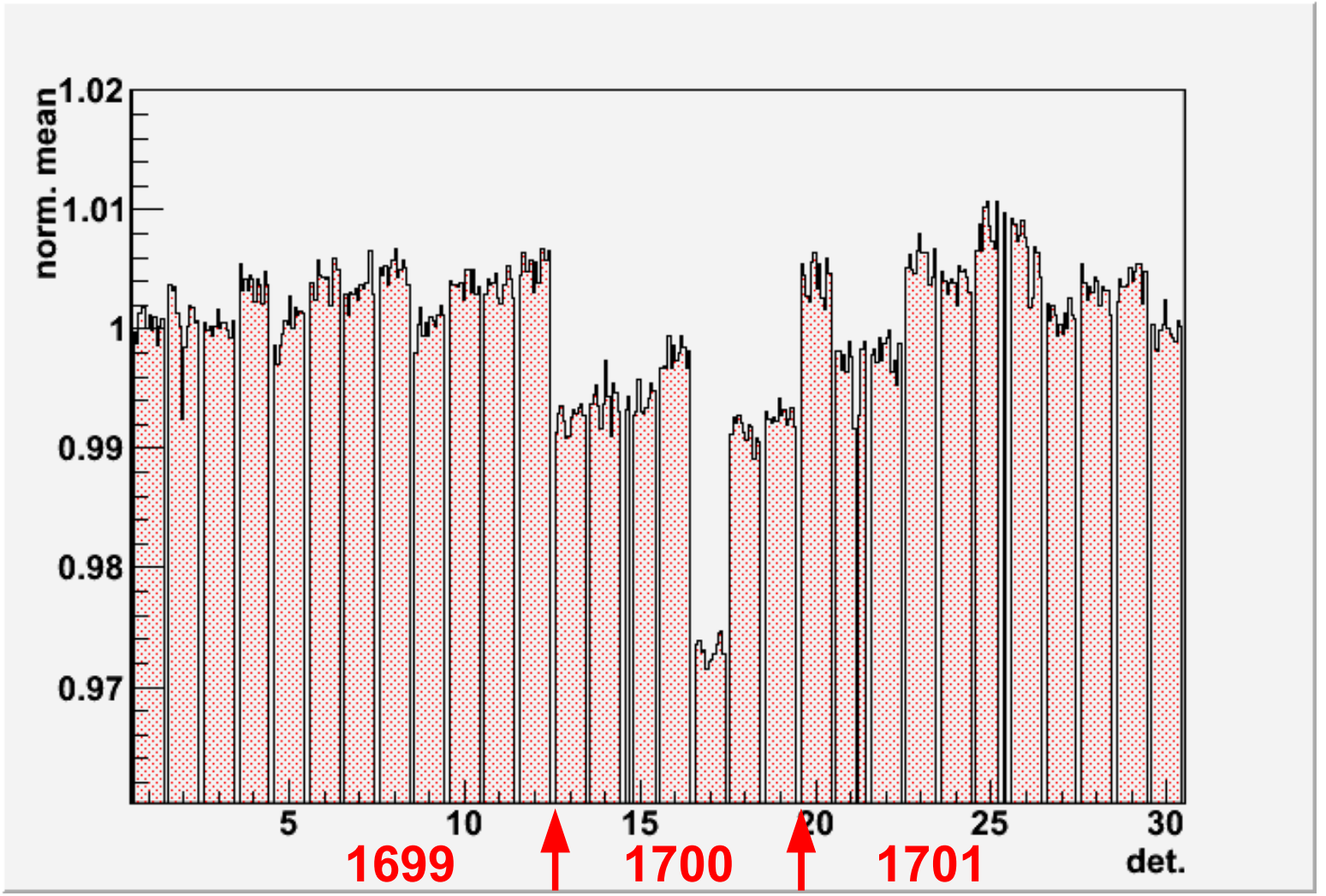
zoom





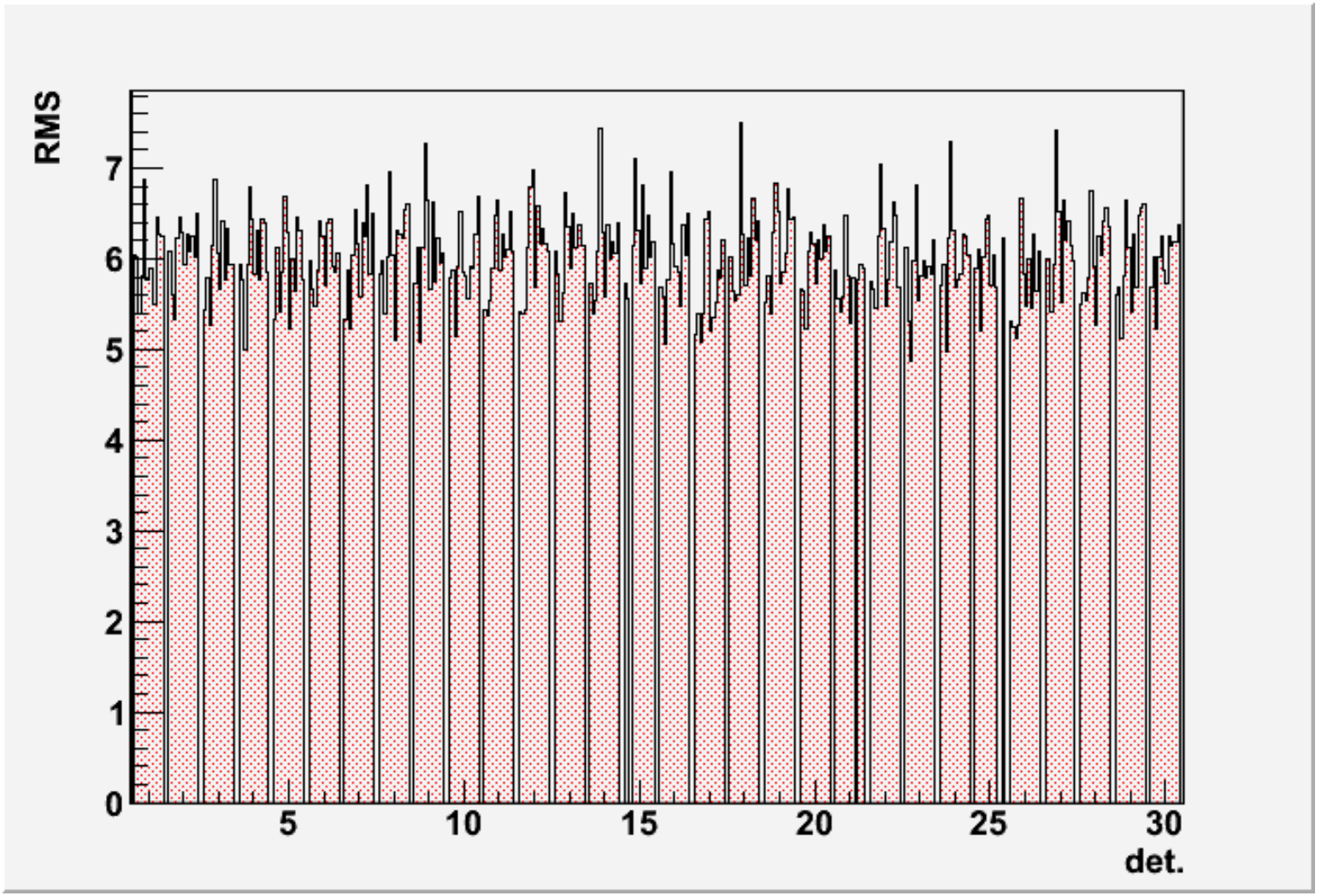
- Correct: normalize by "mean-of-means" each readout chan.

Summary: norm. mean / chan.



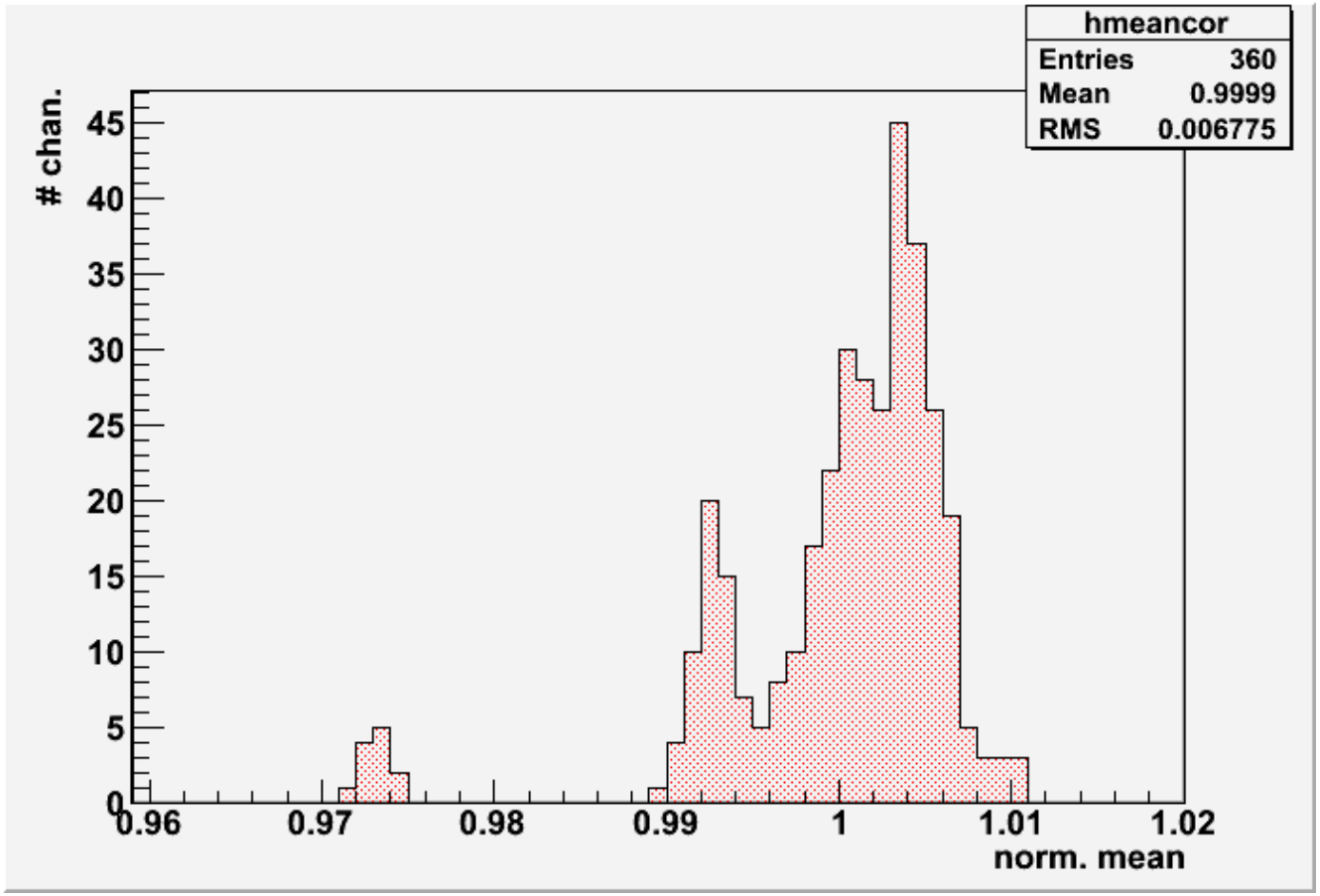
- All means same within ±1%
  except det. 17 = 1700-5 ~3% low
- Wafer-to-wafer systematic variation?

Summary: RMS / chan.



- All RMS ~same

Summary: norm. means



Summary

- Reject detectors w/ dead or noisy chan.:

  1700-3

  1701-2

  1701-6

- Maybe reject detector w/ low (~3%) pulse height:

  1700-5